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Attorney Docket # 5253-27 Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
Peter THURMANN et al.
Serial No.: 10/699,229
Filed: October 31, 2003
For: Piston-Cylinder Unit

Examiner: Schwartz, C. P.
Group Art: 3683

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Thomas C. Pontani
Name of applicant, assignee or Registered Representative

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APPEAL BRIEF

SIR:

This is an appeal, pursuant to 37 C.F.R. §1.192(a) from the decision of the Examiner in the above-identified application, as set forth in the Final Office Action dated January 6, 2005 wherein the Examiner finally rejected certain of appellant's claims. The rejected claims are reproduced in the Appendix A attached hereto. A Notice of Appeal was filed on April 6, 2005.

The fee of $500.00 for filing an Appeal Brief (Large Entity) pursuant to 37 C.F.R. §1.17(f) is submitted herewith. Appellants requests a one-month Extension of Time of the original shortened statutory response period to file this Appeal Brief. A Petition for the one-month extension of time is enclosed herewith along with the fee of $120.00 (Large Entity). Any additional

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fees or charges in connection with this application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

REAL PARTY IN INTEREST

The application has been assigned to Stabilus GmbH of Koblenz, Germany. The assignment is recorded at Reel 015181, Frame 0107.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claims 1, 3-21 are pending. Claims 14-21 have been allowed. Claims 8-12 have been indicated allowable. Claim 2 has been cancelled without prejudice. Claims 1, 3-7 and 13 are being appealed, and appear in the claims.

STATUS OF AMENDMENTS

A Request for Reconsideration was filed on March 7, 2005 after the final rejection, That Request was considered but as indicated in the Advisory Action dated March 31, 2005 did not place the application in condition for allowance.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention recited in independent claim 1 relates to a piston-cylinder unit, often referred to as a pneumatic spring which is operative to connect mechanical parts capable of

moving relative one another. See specification, page 2, paragraph [0001]. The piston-cylinder unit comprises a cylindrical pressure tube and a piston rod reciprocally displaceable in the pressure tube so that the outer end of the piston rod is guided outside one end of the pressure tube. See specification, page 8, paragraph [0030]; Claim 1. When the pneumatic spring operates in a moist environment, the outer surface of the pressure tube is exposed to moisture and tends to rust. See specification, page 1, paragraph [0002].

To increase the useful life of the pressure tube, the claimed invention provides for a heat-shrink sleeve that surrounds the outer surface of the pressure tube and encloses a gap which is formed between the end face of the pressure tube and the opposing surface of the piston rod. See specification, page 3, paragraph [0005]; Claim 1. The heat-shrink sleeve extends into the gap so as to prevent penetration of moisture into the gap. See specification, page 2, paragraph [0004].

A cylindrical pressure tube 1 has a rounded end 15 facing away from the interior of the pressure tube 1 and comprising a rounded end wall 9 which is traversed by a piston rod 5 reciprocally moving through the pressure tube 1. See FIGS. 1 and 2; specification, page 9, paragraph [0036]. The end wall 9 terminates at a radial distance from the piston rod 5 so as to define a gap 10 with the outer periphery of the piston 5. See FIG. 2; specification, paragraph [0034]. The interior of the pressure tube 1 is sealed by an end ring 14 having a curved outer edge which extends complementary to and rests on the rounded end 15. See specification, paragraph [0036]. The ring end 14 extends between the piston 5 and the inner surface of pressure tube 1 and comprises an annular channel 16 which is formed in the outer surface of the ring's outer edge so that the annular channel 16 axially opens into the gap 10 and radially opens towards the piston 5. See specification, paragraph [0037].

A heat-shrink sleeve 8 surrounds the entire outer surface of the pressure tube 1 and has an end surface 19 extending complementary to and resting on the outer axial surface of the tube's end wall 9. See FIG. 2; specification, paragraph [0036], Claim 3. To prevent penetration of moisture between the heat-shrink sleeve 8 and the outer surface of the pressure tube 1, the end surface 19 of the heat-shrink sleeve 8 extends axially inwardly into the opening 10 and further into the annular channel 16 of the end ring 14. See Figure 2; Claim 1. As a consequence, the end surface 19 of the heat-shrink sleeve 8 encloses the end wall 9 of the pressure tube 1 and effectively prevents penetration of moisture from outside into the pressure tube 1. See specification, paragraph [0040]; Claim 1.

The claimed invention thus prevents corrosion of the outer surface of the pressure tube and maintain the gas spring without periodically cleaning and painting the outer surface of the tube. See specification, paragraph [0007].

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1, 3, 4, 5, 6, 7, and 13 are patentable under 35 U.S.C. §103(a) over U.S. Patent No. 4,281,884 (Freitag et al.) in view of U.S. Patent No. 5,791,445 (Kaufmann et al.).

ARGUMENT

The appealed claims include one independent Claim 1 reciting a piston-cylinder unit having a cylindrical pressure tube 1 which is formed with an end wall 9 provided with an end face that faces a piston 5 and is laterally spaced therefrom so as to define a central opening. The piston rod 5 extends through the central opening so that the piston rod's periphery and the end face of the end wall 9 form a ring-shaped gap 10. A heat-shrink sleeve 8 surrounds the pressure tube 1 so as to

prevent moisture from penetrating through the ring-shaped gap 10 into the interior of the pressure tube 1.

An object of appellants' claimed invention to prevent the moisture from entering the mouth and detrimentally affecting the outer surface of the pressure tube 1. See specification, page 3, paragraph [0003]. This object is achieved by the heat shrink sleeve 8 surrounding the pressure tube 1 so that the end portion of the heat shrink sleeve 8 axially extends into the end face of the end wall 9. As a consequence, the heat shrink sleeve 8 seals off the gap 10 so as to effectively block moisture from penetration into a space formed between the heat-shrink sleeve 8 and the outer surface of the pressure tube 1.

Freitag et al. teaches a pneumatic spring that "fulfills besides its function as a balancing means also the function of transmitting electrical current between said mechanical parts." See Freitag et al, column 1, lines 13-16. The pneumatic spring comprises a cylinder member 1 and a piston rod member 2 which is introduced into the cylinder member 1 so as to define a gap between the end face of the cylinder member 1 and the periphery of the piston rod member 2. An insulating coat 10 extends complementary to the outer surface of cylinder member 1 and terminates in a plane common with the end face of the cylinder member. Accordingly, the insulating coat 10 does not extend into the gap, as illustrated in FIGS. 1 and 3.

The Examiner states that element 36 of Freitag et al. extends into the gap. See Office Action dated January 6, 2005, page 2, paragraph 4, the line next to the last line. Freitag et al. does not recognize or address the problem of preventing moisture from entering the interior of the cylinder member 1. The element 36 is made from an electrically insulating material and employed as a shield to prevent undesirable contacts with the electrically conductive piston rod member 2.

The shield 36 "may be a bellows of insulating material" mounted to the piston rod member 2. See column 3, lines 22-25. Once mounted, the shield 36 travels with the piston member 2 between a fully expanded position (not shown) and a fully contracted position (FIGS. 1 and 3) of the piston rod member 2. When the piston rod member 2 is fully expanded, the electrically insulating shield 36 is spaced from the gap. This teaching is provided by U.S. Patent No. 3,919,509 (Schnitzius) referred to by Freitag et al. in column 1, lines 47-48, as having the same basic structure of the pneumatic ring as the one disclosed in Freitag et al.. FIG. 1 of Schnitzius discloses that an insulating shield 16, which is a structural and functional equivalent of the electrically insulating shield 36 of Freitag et al., is axially spaced from the gap between the piston rod member and the cylinder member in the expanded position of the former.

In summary, Freitag et al. does not have any disclosure or suggestion of (1) having the shield 36 formed unitarily with the insulating coating 10, and (2) using the heat-shrink sleeve 10 so that it extends axially into the ring-shaped gap between the end face of the cylinder member 1 and the piston member 2 to enclose the end face of the cylinder member to prevent penetration of moisture inside the cylinder member, as recited in appellant's independent claim 1. In fact, the Examiner concedes that Freitag et al. lacks teaching these elements. See page 3, lines 1 and 2 of the Final Office Action.

The Examiner, however, states that Kaufmann et al. remedies the deficiencies of Freitag et al. and "provides this general teaching." See Office Action, page 3, line 3. As best shown in the sole figure, Kaufman et al. suggests using a cylindrical segment 24 of a shrink-wrap sleeve 22 "that wraps around an axial portion of the piston rod 14" outside a closed end 16 end of a cylinder 12. See column 2, lines 46-48.

Providing the cylindrical segment 24 of Kaufman et al. in order to modify Freitag et al., as argued by the Examiner, cannot render the structure as recited in Claim 1 unpatentable.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine,* 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones,* 21 USPQ2d 1941 (Fed. Cir. 1992).

Freitag et al. is concerned with electrically insulating electro-conductive parts primarily used in the rear gate of a station wagon, motor hoods and trunk lids, which are typically not exposed to the moisture. See column 3, lines 60-62. In contrast, Kaufman et al. does not have such a concern, since there is no electro-conductive parts in the structure disclosed Kaufman et al. The Examiner has not shown where the motivation to combine Freitag and Kaufman comes from, how Freitag et al. relates to preventing corrosion of the components of the disclosed structure and, by implication, why Freitag et al. would be modified to provide sealing off the gap between the piston and cylinder members, or how the deficiency of the teaching of Freitag et al. can be remedied.

The Examiner bridges the gap between the combination of prior art references and the invention recites in claim 1 by suggesting that the cylindrical segment 24 of the heat-shrink sleeve of Kaufmann et al. be extended into the gap between the cylinder member 1 and the piston member 2 of Freitag et al. which would lead to the structure as recited in Claim 1. In essence, the Examiner completely ignores the teachings of Kaufmann et al. which suggests wrapping the

cylindrical segment portion that extends axially outwardly from the end face of the cylinder around the piston.

The Examiner further states that Kaufmann fairly suggests that the insulating coat 10 and the insulating sleeve 36 of Freitag et al. be made integral. See Office Action, page 33, lines 8-9. If this were possible, Freitag et al. would be inoperable. Since Freiteg et al. teaches that the electrically insulating sleeve 36 is displaceable with the piston member, fixing the sleeve 36 to the coating 10, which is stationary, to the displaceable sleeve would lead to (a) preventing the sleeve from traveling, or (b) tearing the sleeve 36 apart from the rest of the coating 10 during the expanded of the piston rod.

If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the prior art are not sufficient to render the claims *prima facie* obvious. *In re Ratti,* 123 USPQ 349 (CCPA 1959). Yet the Examiner's proposed modification of Freitag et al does exactly what the case law proscribes; it renders the insulating sleeve 36 inoperable for its intended purpose, which is to move along with the piston member.

In sum, the final rejection relies on a combination of references for which no motivation has been provided, and still falls short of meeting the limitations of appellants' invention as recited in claim 1.

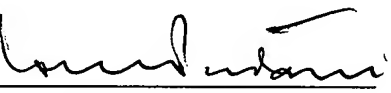
All of the appealed claims are patentable for the reasons outlined above.

Additionally, claim 3 is separately patentable because it recites that the sleeve surrounds and is axially supported by the end wall of the pressure tube. The cited prior art provides no incentive to use a heat-shrink sleeve that surrounds and axially supports the radially inward facing end wall, as recited in claim 3.

CONCLUSION

For the foregoing reasons, it is submitted that the combined teachings of Freitag and Kaufmann fail to establish a *prima facie* case of obviousness with regard to the subject matter of any of claims 1, 3-7 and 13. The final rejection of these claims should therefore be reversed.

Respectfully submitted,
COHEN, PONTANI, LIEBERMAN & PAVANE

By 

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CLAIM APPENDIX

1. A piston-cylinder unit comprising:

a cylindrical pressure tube having an end with an end face surrounding a central opening, said cylindrical pressure tube being formed at said end to form an end wall, said end face facing radially inward to define said central opening;

a piston rod extending through said central opening and forming a ring-shaped gap between said piston rod and said end face; and

a heat-shrink sleeve surrounding said pressure tube and extending axially into said ring-shaped gap, enclosing said end face.

3. A piston-cylinder unit as in claim 1 wherein said sleeve surrounds and is axially supported by the radially inward facing end wall.

4. A piston-cylinder unit as in claim 1 further comprising a piston rod guiding and sealing unit received in said cylindrical pressure tube toward said end wall, said piston rod being axially movable through said unit, said guiding and sealing unit comprising an end ring which is enclosed by said end wall.

5. A piston-cylinder unit as in claim 4 wherein said end ring comprises an annular channel surrounding said rod and facing said ring-shaped gap.

6. A piston-cylinder unit as in claim 5 wherein said annular channel has a radially outer cylindrical wall with a diameter, the central opening of the end wall having a

diameter which is greater than or equal to the diameter of the radially outer cylindrical wall of the annular channel.

7. A piston-cylinder unit as in claim 5 wherein said annular channel has a radially outer cylindrical wall with a diameter, the central opening of the end wall having a diameter which is less than the diameter of the radially outer cylindrical wall of the annular channel.

13. A piston-cylinder unit as in claim 1 wherein said cylindrical pressure tube comprises a cylindrical part and a rounded transition between said cylindrical part and said end wall.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None